

CLAIMS

What is claimed is:

1. A vacuum cleaner air/liquid separator, comprising:
  - 5 an offset air/liquid airflow inlet for receiving an air/liquid airflow, with the offset air/liquid airflow inlet possessing a width and a height;
  - a substantially cylindrical separator chamber communicating with the offset air/liquid airflow inlet, wherein the offset air/liquid airflow inlet is radially offset from the separator chamber; and
  - 10 a lead-in track extending from the offset air/liquid airflow inlet and at least partially around the circumference of the separator chamber, with the lead-in track tapering from substantially the width of the offset air/liquid airflow inlet into the separator chamber, wherein the air/liquid airflow is entrained into a downward spiraling path in the separator chamber by the lead-in track.
- 15 2. The separator of claim 1, further comprising:
  - a separator lower chamber, with the separator lower chamber opening into the separator chamber;
  - a liquid outlet located at a bottom of the separator lower chamber, wherein liquid
  - 20 separated from the air/liquid airflow drops out of the air/liquid separator through the liquid outlet;
  - an impeller air inlet tube extending down through the separator chamber, with the impeller air inlet tube including an air only inlet; and
  - a separator impeller chamber adapted to house an impeller for generating the
  - 25 air/liquid airflow, with the separator impeller chamber communicating with an air outlet located on an exterior of the air/liquid separator and with the impeller air inlet tube.
- 30 3. The separator of claim 1, wherein the offset air/liquid airflow inlet introduces the air/liquid airflow into the separator chamber at a greater radial distance from a central axis than a distance of a chamber outer wall to the central axis.
4. The separator of claim 2, with the separator lower chamber comprising a substantially tapered separator lower chamber.

5. The separator of claim 2, with the separator lower chamber comprising a substantially conically tapered separator lower chamber.
- 5 6. The separator of claim 2, with the air only inlet of the impeller air inlet tube being located in the separator lower chamber.
7. The separator of claim 2, with the air only inlet of the impeller air inlet tube being located above the liquid outlet of the separator lower chamber.
- 10 8. The separator of claim 2, further comprising a liquid deflector skirt located on the impeller air inlet tube, with the liquid deflector skirt extending downwardly and outwardly from the impeller air inlet tube.
- 15 9. The separator of claim 2, further comprising one or more vanes located in the impeller air inlet tube.
10. The separator of claim 1, further comprising one or more vortex disruptor ribs positioned on an inner surface of a chamber outer wall.

11. A method of providing a vacuum cleaner air/liquid separator, the method comprising:

providing an offset air/liquid airflow inlet for receiving an air/liquid airflow, with the offset air/liquid airflow inlet possessing a width and a height;

5 providing a substantially cylindrical separator chamber communicating with the offset air/liquid airflow inlet, wherein the offset air/liquid airflow inlet is radially offset from the separator chamber; and

10 providing a lead-in track extending from the offset air/liquid airflow inlet and at least partially around the circumference of the separator chamber, with the lead-in track tapering from substantially the width of the offset air/liquid airflow inlet into the separator chamber, wherein the air/liquid airflow is entrained into a downward spiraling path in the separator chamber by the lead-in track.

12. The method of claim 11, further comprising:

15 providing a separator lower chamber, with the separator lower chamber opening into the separator chamber;

providing a liquid outlet located at a bottom of the separator lower chamber, wherein liquid separated from the air/liquid airflow drops out of the air/liquid separator through the liquid outlet;

20 providing an impeller air inlet tube extending down through the separator chamber, with the impeller air inlet tube including an air only inlet; and

25 providing a separator impeller chamber adapted to house an impeller for generating the air/liquid airflow, with the separator impeller chamber communicating with an air outlet located on an exterior of the air/liquid separator and with the impeller air inlet tube.

13. The method of claim 11, wherein the offset air/liquid airflow inlet introduces the air/liquid airflow into the separator chamber at a greater radial distance from a central axis than a distance of a chamber outer wall to the central axis.

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14. The method of claim 12, with the separator lower chamber comprising a substantially tapered separator lower chamber.

15. The method of claim 12, with the separator lower chamber comprising a substantially conically tapered separator lower chamber.
16. The method of claim 12, with the air only inlet of the impeller air inlet tube being  
5 located in the separator lower chamber.
17. The method of claim 12, with the air only inlet of the impeller air inlet tube being located above the liquid outlet of the separator lower chamber.
- 10 18. The method of claim 12, further comprising providing a liquid deflector skirt located on the impeller air inlet tube, with the liquid deflector skirt extending downwardly and outwardly from the impeller air inlet tube.
19. The method of claim 12, further comprising providing one or more vanes located in  
15 the impeller air inlet tube.
20. The method of claim 11, further comprising providing one or more vortex disruptor ribs positioned on an inner surface of a chamber outer wall.